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EARLE'S

TWO LECTURES

ON THE

PRIMARY AND SECONDARY TREATMENT

OF

BURNS.

18, 2

MASSACHUSETTS GENERAL HOSPITAL

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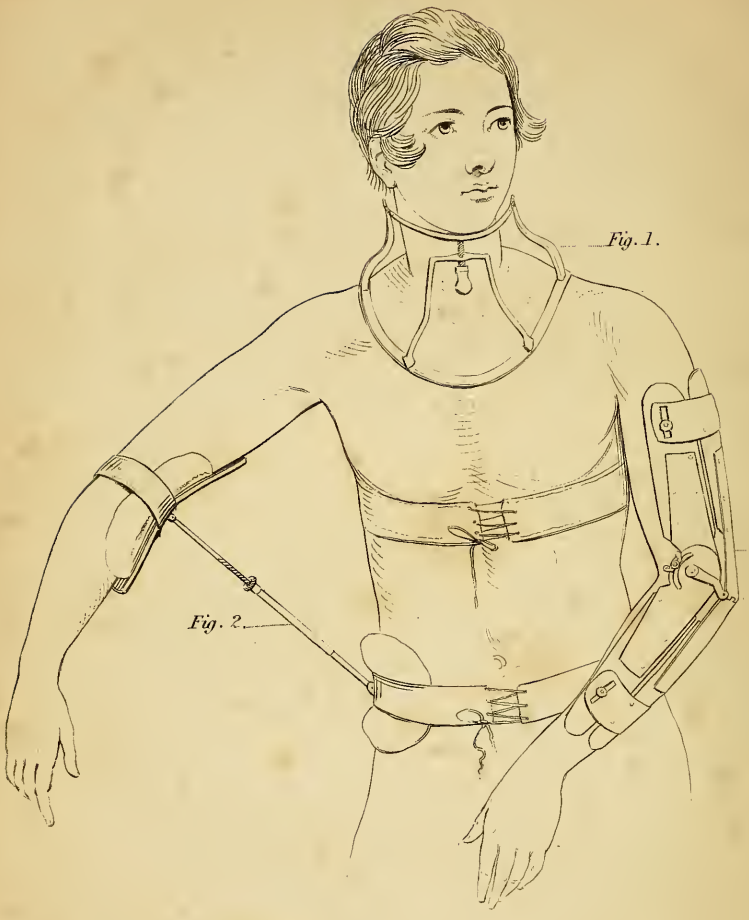
PLATE I.



H.E.inv.t

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TWO

LECTURES

ON THE

PRIMARY AND SECONDARY TREATMENT

OF

BURNS.

BY

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PREFACE.

The following Lectures were addressed to the pupils attending my clinical class, and were intended solely for their instruction.

The principles which they inculcate I have endeavoured to enforce, by precept and example, for many years.

As the subject is one of very general importance, I have, at the instigation of an old pupil and friend, determined to give them more publicity. I have been further induced to take this step from the numerous instances of deformity and lameness which present themselves every year for admission into St. Bartholomew's requiring very painful and serious operations; the majority of which might unquestionably have been prevented, if the rules contained in the following pages had been attended to. I have yet a further

motive for publishing: many fathers of families and other non-professional persons have asked me, what they ought to do in the event of any severe burn or scald, before they could obtain professional assistance. The directions contained in the following pages are so simple that I trust they will be understood by every one. It has been my endeavour to compress my matter as much as possible, as I am aware that the present age is not very well disposed to the study of elaborate works. At the same time I trust, that nothing of practical importance has been omitted. If I could flatter myself that my humble effort to be useful to my fellow-creatures should be the means of introducing, into general practice, a more rational plan of treatment, than those usually adopted in such cases, and, consequently, of preventing the frequent occurrence of deformity and lameness after severe burns, my object would be fully answered.

28. *George Street*,
March 14. 1832.

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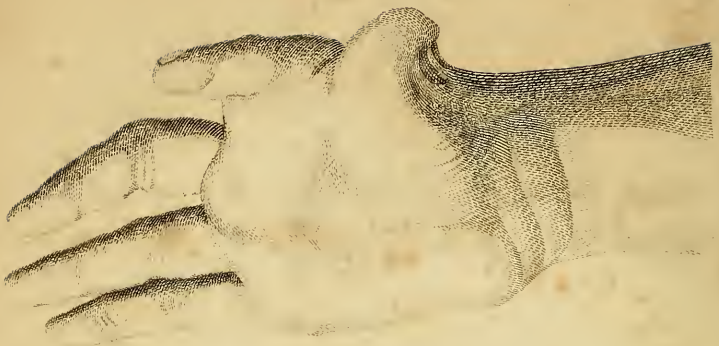

DESCRIPTION OF PLATES.

PLATE I. represents the application of three different instruments for the cure of contractions occurring after burns.

Fig. 1. delineates an apparatus which has been frequently resorted to for the cure of contractions of the neck after the performance of the operation described in the second lecture. A similar machine has also been successfully employed in preventing such contractions. A modification of this was used in the case of Eliza Russel: see pages 45. and 46.

Fig. 2. exhibits the action of the double screw and splint, employed in the case of the patient whose arm was pinioned to his side, alluded to at page 41. A similar instrument has been found very efficacious in cases of severe burns in and near the axilla and back of the shoulder. A modification of this was employed to extend the leg, in the case of contracted knee related at page 56.

Fig. 3. represents a graduated splint for the extension of the forearm, in cases of contraction occurring at the elbow joint. The degree of flexure is regulated by a screw, which admits of the slightest gradations. These several instruments, and their various modifications, have been repeatedly employed, and may be obtained at Mr. Ferguson's, Surgical Instrument Maker, Smithfield.

PLATE II. is a representation of some contractions of the fingers and thumbs which were restored by the operation, and subsequent process of gradual extension described in the second lecture.

ON BURNS.

LECTURE I.

Gentlemen,

There are several cases of very severe and extensive burns at present in the hospital; a circumstance which induces me to invite your attention to this important subject. In doing so, I shall have occasion to deviate from what may be considered as strictly clinical observations, and enter more fully into detail, to explain the views which I entertain, and the principles which regulate my practice. It is a subject which well merits your most serious attention; not only from the frequency of its occurrence among the labouring poor, but likewise from the fatal results which so frequently follow, and the calamitous deformities and lameness which so often ensue, should the patient survive the injury.

It is, I conceive, most desirable to establish some fixed and settled principles to regulate your conduct in these cases, more especially as so many and such opposite plans of treatment have been advocated at different times; and even at the present day the opinions of practitioners are at variance, and the treatment followed in different institutions is very opposite and uncertain.

With unprofessional persons there appears to exist some undefined mysterious notions respecting the nature of the injury, and the treatment which should be pursued. Even persons of mind and education appear totally at a loss how to proceed on the occurrence of such an accident; of which I have met with more than one very striking example in my own practice, where much time has been lost, to the serious injury of the patient, from the distressing uncertainty as to the proper course to be pursued. Such a state of uncertainty in unprofessional persons is far from surprising, when we consider the divided state of professional opinion, and the wild and untenable theories which have been broached at different times. This is to be regretted, as much time is often lost, and the patient al-

lowed to remain in a state of suffering until medical assistance can be procured, even when the best and most efficacious remedy may be immediately at hand; but which the patient or the friends are afraid of resorting to, from some mysterious fear that the dictates of common sense are not to be followed in these cases. Gentlemen, it is not without a hope, and certainly with the wish of being useful, that I undertake to address you on this subject; and that I shall endeavour to reconcile the discrepancies which exist, and to establish rules for the treatment of these cases on something like rational principles. By burns or scalds are understood those inflammations, with their usual consequences, which are produced by the action of high degrees of heat applied to the different textures of the body. In severe burns, the vitality of the skin and flesh is often completely destroyed by the action of the fire, which actually decomposes it, and renders it a *caput mortuum*, without the intervention of any previous inflammatory process. The human body, in health and vigour, is endued with extraordinary powers of resisting temperature, and of maintaining a standard heat of its own under every va-

riety of atmospheric change, with scarcely any perceptible deviation. Certain individuals appear to possess the power of resisting high temperature to a very marvellous degree; but with the generality of mankind, heat, whether dry or moist, beyond a certain point, induces inflammation, vesication, or mortification, according to the degree of heat, the duration of its application, and, probably, the peculiar temperament of the individual. By this latter observation I would wish to imply that an impaired state of the nervous influence renders the body less capable of maintaining its own standard temperature, and resisting that of surrounding media. This is the only rational explanation I can offer of the very different effects produced on the human body by apparently the same extent of injury and the same degree of heat. To illustrate this, I will mention the particulars of a case which occurred during the last summer. A lady who had been long resident in India, where she had a large family, and who had suffered considerably during her voyage home, soon after her return had the misfortune to set fire to her sleeve, which, together with part of her gown, was destroyed

by the flame. She was quite dressed at the time, and her stays were only very slightly scorched on the outer side; her chemise did not appear in the least degree injured. I was called to her the day following the accident, when I found that the whole depth of skin of the entire arm, shoulder, neck, and side, down to the lower margin of the ribs, was destroyed, and had lost its vitality, the slough being deepest and longest to separate over the serratus magnus muscle, which was eventually in part exposed. Now, a very considerable part of this dead surface had not been at all exposed to the flame, the stays being only slightly scorched, but quite entire; yet the heat conveyed through them had produced such destructive effects upon the integuments. This case is certainly very remarkable; but I have no doubt that similar cases have occurred in various degrees, and I can only conjecture that the state of her nervous powers was impaired, and had in some degree lost its conservative influence. I am further borne out in this supposition by the phenomena which occur when any part of the living body is deprived, by operation or injury, of the principal supply of nervous power. Some inter-

esting examples, illustrative of the influence of the nervous system in regulating the animal temperature, occurred in my practice many years since, which I published in the "Medico-chirurgical Transactions*," in a paper on animal heat. It may not be uninteresting to cite one or two instances briefly. I had occasion to remove a large portion of the ulnar nerve in a young female, for the cure of tic doloureux. For a long time after the removal, the parts supplied by that nerve, namely, the little finger and one side of the ring-finger, were incapable of resisting changes of temperature, which did not in the least degree affect the rest of the hand. Thus, moderately hot water produced frequent vesications; and exposure to cold air induced sloughing of the extremity of the finger, and loss of the nail. In another instance, where the axillary plexus of nerves was crushed by a comminuted fracture of the clavicle, leaving the whole arm in a paralytic state, the same phenomena presented themselves. The patient, on one occasion, immersed his arm in warm grains for some time, and, on removing it, the whole hand and forearm were covered with vesications.

* Vol. vii. p. 173.

I mention these cases, as tending to throw some light on this obscure subject. Whether the explanation offered be satisfactory or not, it is right that you should be aware of the fact, that the effect produced is not always proportionate to the quantity of heat applied. It is a subject which might possibly be of much moment as a question of medical jurisprudence. I must not, however, pursue it at present, and can only refer you to the paper in question, should you wish to investigate it further. I shall proceed now to consider the various degrees of injury which may ensue from the application of heat; and these may, for convenience, be arranged under three heads. In the first or mildest form of scald or burn, a degree only of inflammation is produced, which, by proper treatment, speedily terminates by resolution, without exciting any constitutional or symptomatic fever. Even when unassisted by art, many of these cases terminate spontaneously by resolution; occasionally, in irritable habits, such injuries will excite more febrile action, and continued sharp pain, attended with redness and swelling. In such cases vesication may

follow after some interval, as a consequence of the inflammation. Under these circumstances, although the degree of injury inflicted may be moderate, the case may be of importance from the extent of surface which may have been involved, and which may render it of far greater moment, than when a much greater degree of heat has been applied to a more limited surface.

From the second form or degree of injury arising from the application of heat, whether dry or moist, vesications speedily follow, which increase in volume and number according to the nature of the substance which has conveyed the heat, and the extent to which it has been applied. You well know that different substances have different degrees of capacity for caloric; that some part with it more rapidly than others. These circumstances must be borne in mind in estimating the probable extent of injury. Thus, boiling oil will inflict a severer burn than boiling water, and boiling metal a still more severe one. In this second degree of injury from the application of heat, it commonly happens that some part of the surface is denuded of its cuticular covering, leaving a highly inflamed surface in a state of

the greatest excitement, exposed to the action of the air and other stimulants. The inflammation which is excited will also terminate in more extensive vesication than what resulted from the immediate application of the heat. The constitutional disturbance consequent upon such an injury is sometimes very considerable: severe rigor, followed by fever, and much nervous excitement, commonly ensue; and if the surface injured be considerable, serious disturbance of the serous and mucous membranes not unfrequently arises from the functions of so important an organ as the skin being more or less impaired or destroyed.

The third and most important kind of burn is that in which more or less of the integument and the more deeply seated parts are deprived of their vitality, either by the immediate violence and intensity of the heat applied, and the duration of such application, or in consequence of the high degree of inflammation which has been excited, and the peculiar temperament of the individual. Such cases are almost always combined with the two former degrees, as it very rarely happens that the whole force of the fire is expended

on any given spot. One part suffers more severely, and may lose its vitality, whilst those in its neighbourhood may be vesicated and denuded, or only inflamed. Nothing can be more varied than the aspect presented by severe burns: at one part there may be an appearance of deep red, whilst others are vesicated, and a third may present the appearance of an eschar. The parts which are entirely deprived of vitality usually are of a dirty white colour, and the cuticle peels off without rising; at times they have a semi-transparent appearance; and the course of the superficial veins, filled with dry coagulated blood, may be seen crossing in different directions; around these dead portions the integuments have the deepest red, approaching to gangrene, which is gradually lost as you approach the more healthy skin: at other times, when the parts are very deeply destroyed, the eschar has a black appearance, nearly similar to the dry gangrene of the feet of old people.

It is often very difficult at first sight to form any correct opinion of the extent and depth to which this destructive process may have gone; as burns are produced by such

various substances, differing in their sensible temperature, it follows that very different results will ensue from their application, from the duration of their application, and, as I have before stated, the peculiar temperament of the individual: hence, it is always prudent to be guarded in your prognosis when any of the appearances above enumerated are observable. Whatever may have been the exciting cause, all burns of this description must be regarded as most serious injuries, and as claiming your especial attention. The constitutional symptoms which accompany them are always severe. The extremities are generally cold, and the patient experiences rigors, which recur at irregular intervals, and are in general in proportion to the extent, and depth, and importance of the part burnt. Exposure of the surface of the body greatly increases these rigors; so that you generally have an opportunity of witnessing this phenomenon when a patient is first admitted to the hospital. The pulse is frequent and very small. The respiration is often laborious. The stomach is irritable, and rejects its contents. Hiccough ensues, and the patient often sinks into a state of coma,

in which he expires in a few hours, or after an interval of from one to two days. If the patient survive this first stage, he may fall a victim to the symptomatic fever which ensues at any period during the first fortnight. It not unfrequently happens that active inflammation of some of the serous or mucous membranes arises, which may claim all your attention, and require a plan of treatment very opposite to that which the local injury would appear to indicate. These febrile symptoms generally abate after the first fortnight; and if the case terminates unfavourably after this period, the patient sinks, from his vital powers being worn out by copious discharge and continual suffering, and he dies completely hectic. It has often occurred to me, that certain days might be considered critical, from the frequency of a fatal termination on those days, particularly the third and tenth days.

I come now, Gentlemen, to speak of the treatment of burns; and here it must at once be obvious to you that no one plan of treatment can be equally applicable to such various degrees of injury as have been described. On approaching this much disputed subject, I

shall first consider the various plans which have been suggested and employed, and examine what degree of credit they are severally entitled to. I shall then endeavour to fix the principles which should guide you in your choice of remedial means; and, lastly, apply those principles to the various degrees of injury, both with reference to the extent of surface injured and the intensity of the effect produced.

Two modes of treatment appear to have been employed in all ages both by regular practitioners and empirics, and these appear to be diametrically opposed to one another. The one has for its object to diminish the inflammatory symptoms by the application of cold; the other to effect a cure by stimulating applications. The question does not by any means appear to be decided which of these plans should be exclusively adopted in preference to the other. The employment of cold in the treatment of scalds and burns has the boast of antiquity in its favour, as we find it advocated by Rhazes and Avicenna; and, further, it appears, *primâ facie*, consistent with common observation and common sense, namely, to combat an injury inflicted by the

application of too high a temperature, by such means as are calculated directly to diminish the temperature. "Contraria contrariorum sunt remedia," was long a maxim of the schools. Of later years, my father was one of the warmest advocates for this plan; and I may mention, that before I attained the age of five years, I was the subject of a severe burn, and am a living testimony of the efficacy of this plan of treatment. My case is recorded, with many others, in a memoir on this subject, entitled, "On the Means of lessening the Effects of Fire." I have known this cooling plan very successfully employed in many cases, particularly of scalds, to one or more of the extremities.

When the hot fluid has been directly applied to any exposed surface, as the hands, the speedy employment of the antidote, cold, will often prevent vesication, and the case will terminate by resolution. It more commonly, however, happens, that the part affected is at the time enveloped in some article of clothing, as the legs and feet with stockings; in which case more or less vesication is likely to occur, from the clothes retaining the hot liquid in contact with the skin. It unfortun-

ately happens too frequently under these circumstances, that the first thing that is done is to remove the stocking or clothes, which never fails to bring away with it large portions of the cuticle, leaving the highly inflamed cutis quite denuded. If, instead of this forcible removal of the clothes, such limbs were to be immediately immersed in the coldest water, this most serious result would generally be prevented. The same clothes which were the medium for conveying and retaining the heat, may be made the readiest means of abstracting it, and diminishing the inflammation; and should it become necessary, in consequence of the formation of large vesicles, to remove them, they should be carefully cut away, and the vesicles preserved unbroken; by which the serious consequences which always follow the exposure of the highly inflamed cutis will be prevented. If this plan were more commonly inculcated, I am persuaded that much mischief would be avoided; as in a large majority of cases it happens that the bane and antidote are very near at hand, as reservoirs of cold water will generally be found in kitchens, laboratories, &c. where these accidents most frequently occur.

All this appears so obvious, on a moment's consideration, that I feel it almost due to you to apologise for dwelling upon it. Simple, however, as it is, I can only assure you, that in practice you will find it wholly disregarded, even by medical men, who are often over anxious to ascertain the full extent and nature of the injury by ocular inspection.

To return, then, from this digression, the application of cold may, I conceive, be most advantageously employed in many cases of scalds and slighter burns, especially of the extremities, and when the skin is not broken; but when the injury is extensive, and occurs in any part of the chest or trunk, or in a delicate constitution, it cannot be employed without incurring the risk of inducing inflammation of the pleura or peritoneum. The advantages which this cooling plan holds out are, that it may often be resorted to without delay, and it has the effect of affording immediate relief: the disadvantages attending it are, that it is necessary to continue and renew the application of cold for a considerable length of time, as the heat and pain will return, unless the diminished temperature be steadily maintained. There are many dif-

ferent modes in which cold may be employed; ice pounded, and put in a bladder, or snow, or very cold water, or Goulard's lotion, with scraped potatoes, are commonly employed; whatever plan be pursued, it is desirable that the burnt part should never be exposed to the atmosphere until the inflammation be subdued, as reaction is certain to follow every such exposure. One of the most simple and efficacious plans is, to envelope the part with rags, and to keep them constantly wetted with water, in which ice is placed from time to time; *care being taken never to remove the rags from the burnt surface;* whenever the vital powers are depressed, and rigors supervene, the employment of cold is prohibited, a circumstance which will occasionally happen, after even inconsiderable burns, in irritable constitutions.

The contrary or stimulating plan of treatment is also of great antiquity. Aristotle recommended that the burnt or scalded part should be exposed to the heat of the fire to draw out the fire, on the well known principle of the sun extinguishing a common fire. A long list of illustrious names might be adduced in favour of this plan of treatment,

not to omit the immortal Shakspeare, who tells us that "Fire cools fire within the scorched veins of one new burnt;" but I will not detain you further than by saying, that it is now exploded, as causing much and unnecessary pain in slighter cases, and as perfectly inadmissible in more extensive ones. With the same intentions of drawing out the fire, we find a host of stimulating applications have had their advocates in different ages; and, in looking dispassionately over the authorities and experience which have been handed down to us, it must be admitted that many cases have been successfully treated under every modification. It will, perhaps, be fair to cut the Gordian knot, by simply referring these boasted cases, not to the specific agency of this or that remedy employed, but rather to the efforts of nature, which will, in many cases, be crowned with success, in spite of every thing. Different oils, and various unctuous substances have been highly extolled, and, no doubt, they are very beneficial; to me it appears, that the benefit to be derived from them all may be safely referred to one common principle, which we should steadily keep in view, whatever be the application

which may be employed; namely, *as speedily as possible to exclude the air from the inflamed surface*, which never fails to stimulate, and to excite an injurious degree of reaction. To this same principle of excluding the air, all the good which is said to accrue from the revived plans of treatment with flour or fullers' earth, and cotton wool, may fairly be referred. I have said revived plans of treatment, for I find them fully described in Hildanus; and it is amusing to observe with what different views they were employed in his days, and how differently he explains the operation of these remedies.* If then this principle of excluding the air be fairly established as the great desideratum, it becomes comparatively a matter of indifference, what are the means by which we effect this end: not wholly so, how-

* "Omnia remedia ad hunc finem tendunt, nimirum, ut empyreuma, sive calorem ab igne in parte affectâ relictum, aut suffocent, aut resolvent et dissipent. Suffocatio autem empyreumatis fit aut frigidis et humidis medicamentis, veluti succis et aquis sempervivi lactucæ, hyoscyami, solatri, et similibus; aut frigidis et siccis, quemadmodum sunt bolus armenus, terra sigillata, cerussa, argilla fornacum et hujusmodi emplastica quæ poros occludunt. Ita ut calor extraneus ab igne relictus non aliter ac ignis in loco occluso intus suffocetur et extinguatur." — *Hildanus de Combustionibus*, cap. v. p. 920.

ever; as unquestionably experience teaches us that in the more severe burns certain medicated applications exert a very beneficial influence. When the object is only to exclude the air from the denuded surface, and the burn is not very severe, one of the best applications is a liniment composed of lime water and linseed oil; if fine linen be employed, well moistened with this, it will be found to answer every indication. The lime which is held in suspension completely fills up the interstices of the cloth, and effectually excludes the air; whilst the oil renders it so pliant that it may be accurately applied to every surface and cavity. The same effect may be produced with the superacetate or the carbonate of lead, and oil, where the denuded surface is not considerable. This effect of the lime or lead in closing the interstices of the linen is very similar to what occurs in the well known experiment of immersing eggs in lime water to preserve them sweet for an indefinite time, by closing all the pores of the shell, and excluding the air.

The application which is commonly resorted to in this hospital is what is commonly known as Mr. Kentish's plan of treatment;

namely, an ointment composed of unguentum resinæ flavæ and spirits of turpentine. This application approaches very nearly to the one used in the time of Hippocrates; but the views entertained by Mr. Kentish were different and peculiar.* Mr. Kentish has given a very elaborate description of his plan of treatment, founded on the very visionary theory of a supposed analogy between the treatment of frost-bitten parts and parts in a state of the highest possible excitement; an analogy which will not, however, bear a close examination: in pursuing which, he was led into many serious practical errors; yet, upon the whole, we are indebted to him for many useful suggestions. An experienced man, unprejudiced by favourite theories, will easily extract the good and practical parts, and feel grateful for them; whilst he will smile at the ingenious and amusing hypotheses which are built upon them. His treatment was founded on a principle of inducing an unity of action between the injured parts and the general system;

* The ointment used by Hippocrates consisted in a mixture of hog's lard, resin, and bitumen. Thus, after the revolution of ages, we find nearly the same remedies revived under new appellations, and with more philosophical views.

and he divides his treatment into the stimulating and equalising stages. He recommends the use of stimulants to excite the absorbent vessels of the injured part to equal the increased action of the corresponding secreting vessels: in doing this he forgets that he cannot stimulate one set of vessels without also stimulating the other, which are already in a state of over-excitement. In following up his supposed analogy, and gradually diminishing the quantum of stimulus, he advises less stimulating dressings to be applied on the second and third days, even should the patient be perfectly easy and tranquil. "When the pain has ceased," he says, "it will be advisable to desist from the more stimulating dressings, and employ simple digestive and olive oil; and afterwards, on the third and fourth days, the ceratum calaminæ." Now, this appears to me to be one of the most practical errors into which his theory has led him. I believe it to be far better practice to allow the patient to enjoy his state of repose and freedom from pain as long as possible; and to leave the dressings, which are applied on the immediate receipt of the injury, unchanged until suppuration commences; the patient will thus

be rescued from much unnecessary fatigue, and a renewal of suffering which cannot fail to be detrimental, and produce increased constitutional irritation; and the practitioner will be saved, for some time at least, from being harassed by the distressing screams, which, if the subject be young, he will be obliged to submit to during the subsequent treatment. The practice which I have been long in the habit of pursuing, with very happy results, has been to bathe the parts with warm spirits of turpentine; and, as speedily as possible, to envelope every part most carefully with soft lint, thickly spread with the liniment of turpentine and resin cerate. It is better entirely to surround the extremities when burnt, and to retain the dressings with bandages, accurately but not too tightly applied. This application appears very soothing; and the young patient will often cease to cry, and will even fall asleep as soon as dressed.

Having very accurately covered every part of the burnt surface with the dressing, the patient should be suffered to remain quiet, and the dressing should not be disturbed for many days — not, indeed, until suppuration is fully established. If, on removing the

dressings, deep sloughs present themselves, there is no better application than warm emollient poultices. After the separation of the sloughs, the wounds must be dressed, and treated like common ulcers; but it is not my intention, at the present moment, to enter upon the subject of the secondary treatment of burns. The same rules with respect to the mode and accuracy of dressing burns should be adhered to, whether we employ Kentish's ointment, or any other application. The principle of excluding the air and not unnecessarily disturbing the patient should be steadily kept in view, whatever may be the remedial means resorted to.

I come now to speak of the constitutional treatment of recent burns. It will generally be requisite, after the receipt of any considerable burn, to administer some cordial internally combined with opiates. Whenever the pulse is small and feeble, the extremities cold, and there exists a disposition to rigors, it will be right to administer some warm brandy, or wine and water, or ammonia, with from 5 to 60 minims of laudanum, according to the age of the patient. When the vital powers are not depressed, and the patient

suffers much, the opium may be given without the spirit. Considerable judgment is required in administering cordials. The great advocate for this plan, Mr. Kentish, appears to have entertained some very visionary notions, which are mixed up with his really valuable and practical observations. He advises the giving powerful stimuli internally, on the principle of counter-irritation; and he advocates the perseverance in their use for several days, until secretion has taken place. It is true that he adduced some strong facts in illustration of this plan; but I could produce equally powerful arguments to prove that such a practice is most injurious and directly opposed to the dictates of common sense, and all the principles laid down for the treatment of inflammation. To adduce one memorable instance in which this stimulating plan was most injuriously persevered in, I will mention the cases of the firemen who suffered at the burning of Covent Garden Theatre. Several of these unfortunate men were admitted into this hospital, and died with every symptom of inflammation of the membranes of the brain and mucous linings of the lungs.

The stimulating plan was carried to too great an extent in these cases, which was fully proved by examination after death. If the vital powers be greatly depressed you may administer a cordial, and even repeat it until reaction has taken place; but when once that has occurred, it can rarely, if ever, be necessary to persevere in such a plan. When the first stage is passed, light and nutritious farinaceous food should be given, and the bowels gently regulated: opiates will often be required for some time, to allay the irritation and pain. Diarrhœa sometimes supervenes, and is occasionally beneficial when the discharge is very copious. From observing the occasional good effects resulting from spontaneous diarrhœa, when the discharge was profuse, in accelerating the healing process, Mr. Kentish strongly recommends the free use of purgatives under such circumstances, and I have known them very useful. The spontaneous diarrhœa, however, requires to be very carefully watched, as it may arise from a destructive inflammation of the mucous membrane of the bowels, which may require all our efforts to control.

It remains for me to apply the principles

which I have endeavoured to establish, to the the various degrees of burns.

In cases of the first order, where the skin is not broken, it matters little what plan you resort to, provided the extent of surface be not great. When either of the extremities are the parts affected, cold may often be very advantageously employed, provided there be no contra-indication from the state or constitution of the patient. When the surface is considerable, including any part of the trunk, as from a person falling into a vat of hot liquid, there would be danger of continuing the application of cold; though it would be quite justifiable to plunge a person under such circumstances, with all his clothes on, into cold water, if ready at hand: still there would be danger of inducing inflammation of the serous or mucous membrane of the chest and abdomen by the continuance of it. This circumstance should indeed be always carefully borne in mind, whatever be the treatment employed, as one very likely to occur in extensive burns, from the impaired functions of the integuments of the body, by which an additional burden is thrown on the lungs especially. You are well aware that, in a

state of health, there is a constant transpiration going on from the whole surface. When this is checked by sudden cold, pneumonia, pleurisy, or peritonitis, not unfrequently ensue. Exactly the same effect is produced by extensive burns or scalds, which necessarily interfere with this most important function performed by the skin. When you have reason to suspect any of these consequences, bleeding, both local and general, may be required: but, generally speaking, salines, particularly small and repeated doses of nitrate of potash, by increasing the action of the kidneys will render this unnecessary.

In the second order of burns and scalds, when there is more or less of the cuticle destroyed, and the highly inflamed cutis exposed, it is right as soon as possible to exclude the air; and for this purpose, I believe you will find the lime-water and linseed oil a very efficacious remedy. When the vesications are very large, and cause pain from their distension, and when there is danger of their bursting from their bulk or situation, it is advisable to puncture them with a needle at several points, in the direction of the scales of the cuticle; this will allow of the escape of the

serum without admitting the air to the cutis But in all minor cases it is not necessary to do this, and whenever you can with safety leave the bladders untouched for one or two days, it is far better than puncturing them. By carefully pursuing this plan you will in most cases avoid that serious ulceration and sloughing, which so frequently follows the exposure of the inflamed cutis. The fluid will often be entirely absorbed, and the cuticle peel off, leaving the surface quite healed beneath it.

In the third order of burns, it is but justice to Mr. Kentish to say, that I know of no plan of treatment superior to the one which he recommends at the time of the accident. His treatment, however, must be modified in the after stages, and on no account followed up day after day, under the visionary and erroneous impressions which he entertained. It is hardly necessary for me to observe here, that it is a matter of perfect indifference what application be made to those parts which have already lost their vitality; it is to the the parts in the immediate vicinity, those parts which are in the highest state of inflammation, bordering on sphacelation, that you must direct your attention: and from exten-

sive experience I may affirm, that the employment of the stimulating dressings of Kentish will be found preferable to any other plan. Having taken the liberty freely to criticise his more visionary views, it is but justice to give him this share of praise, and to express my individual gratitude to him for the benefits he has conferred on mankind.

LECTURE II.

In my last lecture, Gentlemen, I endeavoured to establish some fixed principles for regulating your conduct in the primary treatment of burns and scalds. I trust that the rules which I inculcated were consistent with common sense, and founded on truth: and if that be so, they cannot fail to stand the test of experience. I propose, on the present occasion, to follow up the subject, and to offer some directions for the subsequent treatment of these cases: and in doing so, I shall point out to you those methods of cure which the ample experience I have enjoyed within these walls has proved to be best calculated to assist the operations of nature, and lead them to a favourable termination. I shall also endeavour to point out the best means of obviating those unseemly deformities, contractions, and lamenesses, which so frequently ensue in these cases when the counteracting influence of art

is not skilfully interposed. I shall conclude with an account of a plan of treatment which I have successfully employed for removing these visible reproaches on the skill of our profession, when they may have occurred. At the outset, I will take the liberty of impressing upon your minds the great importance of personal attention to your charge, instead of delegating it to nurses and ignorant persons; as the future welfare and comfort of your patients, in such cases, so much depends on the judicious application of the means of cure. In the slighter cases of burns, when the cutis only has been exposed and not destroyed, if the first dressings be very nicely and accurately applied, they may be safely left on for many days; until, indeed, they become moistened or offensive from the suppuration which has taken place. We shall often, on removing such dressings, find the greater part of the surface skinned over, and the rest of the wound presenting a healthy granulating surface, or covered by a coating of coagulable lymph. Under these circumstances, it will only be necessary to employ some mild application, as the unguentum zinci oxydi, or ceratum calaminæ, the same

attention being paid to apply the dressings accurately to every part; and these may be again left until they are quite moistened with suppuration. Perhaps every second or third day will be sufficiently often to renew the applications. In some instances the suppuration will be so abundant as to require daily dressing; and in such cases it will be found very advantageous to dust the surface of the wound with a powder consisting of equal parts of myrrh and calamine very finely levigated; and dry lint may be applied upon the ulcer, care being taken to keep the lint within the margin of the sore. This latter point is one of much importance, and certainly not sufficiently attended to. As it applies equally to other ulcers, as well as those arising from burns, I shall venture to dwell a little on this point of practice, and explain my views more at length.

On examining a healthy healing ulcer, we shall always find at the circumference a marginal line of deep red, which has a smooth polished appearance when closely viewed, differing from the irregular granulating surface. This is the newly deposited skin: and becomes more apparent after an ulcer has been

exposed for some minutes. If dry lint, which is often the best and only stimulus wanted for a healthy sore, be applied over this margin, it will adhere so closely to it, that, unless great care be taken to moisten the dressings, in removing them the newly deposited skin will be destroyed, and the surface will bleed; causing considerable pain to the patient; and thus destroying, in one minute, a whole day's reparation. This may be effectually obviated by one of two plans: either by applying narrow strips of lint, smeared with some unctuous substance, round the whole margin of the wound, and filling up the interspace with dry lint, over which a large pledget should be applied, to exclude the air, and prevent the pus which is secreted from encrusting on the wound; or by accurately fitting the size of the lint, so as not to encroach upon the margin of the wound, and then covering the whole with a pledget larger than the entire surface. When the shape of the wound is very irregular, it will be well to make a pattern of it in paper, and, from day to day, to cut the lint smaller as the edges contract. This will often save much time in adapting the lint to the proper form and size, and will

afford a gratifying proof of the daily progress towards a cure. By adopting this simple plan, the whole dressing will come away at once, without causing the slightest pain to the patient, and without requiring the use of water to moisten the applications. This leads me to say a few words with respect to the common practice of washing ulcers; a practice certainly to be reprobated when the secretion is healthy laudable pus, which is nature's best protection for the delicate newly formed granulations. When this is not secreted in sufficient quantity daily to moisten the lint so as to enable it to come freely away, it will be better to leave the dressing for two or more days, and to apply some mild stimulus. In all cases, however, let me earnestly advise you to attend to the rules laid down with respect to the margins of the sores. Remember that it is always from the circumference that a wound heals; and this, therefore, is the part which requires most attention. Be careful to keep the newly cicatrized surface clean; do not allow the cerate or discharge to collect and encrust upon it; and especially guard and protect the exceedingly delicate healing margin by the application of some

mild cerate which will not adhere to it. If, during the progress of the case, the secretion becomes thin and ichorous, and the wound has a glossy even surface, it will be right to employ some more stimulating application than dry lint; and for this purpose the lotions of nitrate of silver and sulphate of zinc will be found very useful: sometimes it will be necessary to vary such applications, and it is well to have many resources to resort to. At times, balsamic applications will agree best, as the Peruvian balsam, or compound tincture of benzoin; at other times, diluted resin cerate, or ung. hydrargyri nitrico oxydi, &c. When the granulations are too prominent, lint dipped in a solution of sulphate of copper will be found very efficacious. When, however, the ulcerated surface is very extensive, it will not be necessary to apply stimulants constantly to the whole extent: you should in these cases bear in mind that it is only from the margin that the wound contracts and heals; and it will be sufficient, therefore, to draw round a stick of nitrate of silver or sulphate of copper just within the healing margin, without endeavouring to repress the exuberant growth of the whole surface, which

will cause unnecessary pain, and exhaust the powers of nature.

In some cases the emplastrum plumbi, either pure or diluted with olive oil, and spread on linen, will be found an excellent application in accelerating the healing, and keeping down the granulations. It is difficult to lay down rules applicable to all constitutions and every variety of case. It will be sufficient to say, that ulcers following burns are often very irritable, and require a change of applications from time to time.

There is only one more general direction which I think it necessary to give. — Whenever the surface of the wound is very considerable, it will be better not to expose the whole at once; but to dress one part first, before another is opened: with the same view it will be right always to prepare your new dressings before you remove the old ones. I enter into these minutiæ of practice, because I do not see them commonly attended to; and I feel confident, that by observing these directions, you will find that extensive ulcers will heal with much greater rapidity, and with a much smoother and softer cicatrix.

In burns of a more serious nature, where

large and deep sloughs present themselves on removing the first dressings, the best possible application will be a soft emollient poultice, until such sloughs are thrown off. After that they will require a similar plan of treatment to that which has been recommended in the ulcerated form of burn. Occasionally, however, it happens that the surface presented on the first coming away of the slough is that of a very highly irritable ulcer; instead of fine healthy granulations, the surface presents a worm-eaten appearance, and many points bleed, and are exquisitely sensible. I have found, in such cases, that it is better to continue the poultices for a few days, and to apply to the surface a watery solution of opium, sometimes with the addition of a few drops of nitric acid. Such ulcers will often require a similar plan of treatment to that employed for phagedenic sores. When the ulcer becomes more healthy, and good pus is secreted, then you may resort to the plan which has been already sufficiently described. The constitutional treatment of burns during this second stage will require to be varied according to circumstances. The diet should be regulated, and the state of the digestive

organs closely watched. Stimulants generally do harm, whether in the shape of food or medicine. Occasional purgatives are very beneficial; and when the secretion is very abundant, the mineral acids, with or without bark, will be required.

I come now to speak of the particular local treatment which will be required in cases where the burn has occurred in the flexures of joints, and in the front of the neck; in all situations, indeed, where contractions are likely to ensue. You are, no doubt, aware that, after the healing of a wound, the cicatrix almost invariably will be found to occupy a smaller space than the original ulcer. This depends partly on the retraction of the surrounding healthy skin after the separation of the slough — of which you have a familiar example in making an issue with caustic potash; but it will be found to depend more particularly on the changes which take place during and after the healing of the wound. The process by which these are effected consists in an absorption of the granulations on which the new skin has been deposited, by which the cicatrix is made to occupy a much smaller extent than the originally ulcerated

surface. Perhaps it would be speaking more correctly, to say that the granulations, which are at first florid and extremely vascular, after having deposited the new skin, receive a smaller proportion of blood, become paler and diminished in bulk, and consequently occupy much less surface for the new skin. In many cases, such as amputation, where sometimes sufficient integuments have not been saved to cover the bones, this process is very salutary, as it is essential to have the smallest possible extent of new skin on a surface which is to be subject to much pressure; so also the curative operations in ectropeon and entropeon, are adopted on this well-known principle of the contraction of the cicatrix. But in extensive ulcers, occurring in the neighbourhood of the neck, and in the flexure of joints, it often causes the most distressing contractions and deformities. The force with which this gradual process acts is truly astonishing; as the repeated drop of water will, in time, undermine the firmest rock, so will this slow but powerful process effect the most extraordinary changes in the form. I have repeatedly known it draw down the chin upon the sternum; and approximate the shoulders,

by the partial absorption of the clavicles, so as to alter the dimensions of the thorax. I have had many instances in which the fore-arm has been permanently bent upon the arm, so as to bring the thumb in contact with the point of the shoulder. In the course of last year, two remarkable instances occurred in this hospital, of which I have an opportunity of presenting you with very faithful drawings. In the one, not only is the whole head bowed down towards the sternum, but actually the firm bone of the lower jaw has been curved downwards, so as only to admit of the last molar teeth coming in contact; the mouth being kept permanently open, and the direction of the incisor teeth being altered so as to cause them to project nearly in a horizontal line. In the other, the arm was pinioned to the side, and the hairy scalp was drawn many inches down the back between the scapulæ. At the present time there is a melancholy instance in the house, where the fingers and thumbs of both hands are drawn together in the palms, so as to render the extremities nearly useless. These examples will suffice to show the extent and nature of such contractions.

The important question now arises, — Is it possible, by any human art, to prevent such occurrences? or does this process baffle all our efforts to control it? In other words, are such consequences as I have now represented to be attributed to the mal-practice and negligence of the surgeon? or are they unavoidable? I have no hesitation in saying, that in a large majority of cases such consequences may be prevented, by the well directed efforts of art, assisted by machinery. It is now nineteen years since I first called the attention of the profession to this subject, and I was then much censured for attributing blame for such occurrences. The opinions I then ventured to broach have been strengthened by every year's experience; and I now fearlessly assert, that, by due attention to very simple principles of conduct, such deformities may generally be avoided. I shall now endeavour to explain those principles to you; and should I not make myself clearly understood, I request that you will not hesitate to ask for further explanation. I am quite ready to admit that it is not in our power to arrest the law of nature by which a cicatrized surface becomes smaller, and

occupies less space, than the original wound; but it is in our power, in most cases, to direct and modify that which we cannot wholly prevent, and thus, at all events, to counteract its injurious effect. We cannot prevent the process of absorption which has been described, but we can prevent its taking place in a direction which may interfere with the healthy functions of the part. To take the upper extremity as an example, I will suppose a case where the whole integuments on the inner and front part of the arm and fore-arm have been destroyed. If such extremity be carefully kept extended on a splint, not only during the whole progress of healing, but long subsequent to the perfect cicatrization, you will find that the cicatrized surface will diminish in a circular direction, drawing the healthy integument together from side to side; but that no contraction will take place in the long axis, in which alone it can impede the due motions of the limb. This permanent extension should be persevered in during the day and night, until all changes have ceased, and the cicatrix has contracted to its smallest dimensions. Care, however, should be taken, during this time,

to give passive motion to the different joints; by which the proper secretion of synovia will be kept up, and the eventual free use of the limb will be ensured.

This plan of maintaining the limb in a state of permanent extension should be commenced as soon as the wound has begun to granulate, and should be persevered in, as before stated, until all changes in the cicatrix have ceased. If this be not commenced thus early, the joint will soon be found slightly bent, and any attempt to extend it will then be productive of pain, and will cause the wound at the flexure of the joint to bleed — perhaps to slough. I am aware that many persons permit such limbs to remain in a bent position during the healing process, from an idea that there will be a smaller extent for cicatrization by thus allowing the ulcerated surfaces to approximate each other, and that they thereby will much accelerate the healing. By such practice the permanent benefit will be sacrificed, to remove a temporary evil; the wound may possibly be healed sooner, but the limb will for ever after remain stiff and useless. In very many cases, however, not only will most serious injury infallibly accrue from

such practice, but even the temporary advantage proposed to be gained will prove entirely fallacious ; for every attempt to extend a limb which has been thus treated, and which has formed an angle, will crack the cicatrix, and cause it to ulcerate and slough on its surface, even for months after the apparent healing of the wound. If, therefore, any argument were requisite, in addition to that of preventing deformity and lameness, to induce you to bestow great attention to position, during, and long subsequent to, cicatrization, in all instances where the wounds are in the neighbourhood of joints, I am fully convinced, from extensive experience, that you will thereby gain much time in effecting a permanent and perfect cure. In the one case, where there is any constant stress on the cicatrix, it will become diseased and indurated, and liable to crack and ulcerate ; in the other case, where no such strain is applied, the wound will heal more rapidly, and the cicatrix will be far more soft and healthy.

I am happy in being able to refer you to the case of Eliza Russel, at present in Queen's ward, who was severely burnt on the inside

of the left arm and fore-arm, and who has been treated in the manner above described, and the wounds are now rapidly healing.* The same patient was extensively burnt from the chin to the front of the chest, including the whole neck; and this leads me to observe, that, in endeavouring to counteract contraction in different parts of the body, very different modifications of splints, and a variety of apparatus, will be required, which the necessity of each particular case will dictate, and your own ingenuity must supply. In this case it has been necessary to employ a bandage expressly contrived to keep the head back, as it was impossible to apply any pressure under the chin; and, consequently, the stiff collar usually employed in such cases could not be relied on. In cases of severe burns of the extremities, including the flexure of any joint, the employment of permanent extension on splints will commonly be sufficient to answer every indication; but in burns about the neck, and at the lower part of the abdomen and groin,

* Since this lecture was delivered this patient has perfectly recovered from the burn in her arm, which is quite straight, and the cicatrix soft and pliant; and her neck is nearly healed without any depression of the chin.

much ingenuity will sometimes be required to attain the desired ends. When, however, the simple principle of counteraction be properly understood, it will not be very difficult to modify and adapt the proper means for attaining the object.* It may, however, occasionally happen that all our efforts will prove unavailing, and an unseemly cicatrix and permanent lameness will be the result. In such cases, which have resisted all our efforts to prevent these disastrous occurrences, it will be in vain to attempt, by operations, to correct the evil; for the same difficulties which opposed themselves in the first instance, will equally baffle all our efforts at remedying the existing defects. Cases are, however, too frequently occurring, where most unsightly deformities and serious lameness are the results of inattention, and a total disregard to the rules which have been laid down as necessary to be pursued to prevent such consequences; and many of these cases admit of being partially, if not wholly, restored, by a plan of

* I have added a plate at the end of this lecture exhibiting some of the means which I have employed in such cases. I have likewise subjoined a sketch of some contractions of the hands, which were perfectly restored. — See plates.

treatment which I shall now proceed to detail. It will be right, in the first place, to offer a few observations on the structure and nature of the diseased and indurated cicatrices which follow the healing of burns. Whenever any unnatural contraction follows a burn, the cicatrix becomes more or less indurated and callous; sometimes to a most extraordinary extent, so as to merit the epithet of scirrhous. To what are we to attribute the more frequent occurrence of such indurated contraction after burns, than after any other description of ulcers? This is a question not easy to solve; but I believe it, in many cases, to depend on the constant state of irritation and chronic inflammation which is kept up by the continual stretching of the part affected, in the vain attempts made to extend the limb. That this may fairly be considered as one fruitful cause of such defects, may be inferred from the fact, that when a limb, under apparently similar circumstances, is kept extended during and after the healing, no such diseased cicatrix will result. Still, however, it must be admitted that, in some parts of the trunk, where no such contraction can operate, the cicatrices after

burns form prominent ridges, and are morbidly hard; probably in consequence of the extensive destruction of the subcutaneous cellular tissue.* This will at times amount to an increased morbid growth, to a considerable extent, which will have, when cut into, all the characters of a true scirrhus. Such a case occurred to me, some years since, in the person of the young female, of whose neck I now present you a drawing, exhibiting prominent pendulous tumours, one of which I removed, and approximated the healthy integuments, in hopes of obtaining union by first intention. Erysipelas supervened, and the surface granulated; and after it had healed, the same diseased growth returned nearly to the same extent. This is the only instance

* The speculations of Hildanus as to the causes of this induration may be amusing to some of my readers. "Præcipuæ causæ turpitudinis cicatricum post combustionum curationes sunt, primo, quod cutis, caro, venæ, &c. vi ignis contrahuntur et indurantur; secundo, quod humidum radicale (cujus beneficio vulnera et ulcera omnia cicatrizantur) vi ignis exiccatum consumptum est, inde fit ut quemadmodum siccus et aridus ager, spinas tortuosas zizania et omnia imperfecta, ager vero pinguis et humidus omnia perfecta producit: ita etiam ex caloris innati et humidi radicalis defectu cicatrices fiunt turpissimæ. — *De Combust.* cap. 14.

of the kind which I have met with, and it appeared to depend on some peculiarity of the individual, as the whole original cicatrix was freely removed. When such a horny web or cicatrix, as I have described, has contracted any joint, or the neck, it would appear, to a superficial observer, that the whole evil depended on the contracted integuments, by a simple division of which the limb would be instantly set at liberty. So deceptive is this appearance, that I have known, more than once, that surgeons have indulged this vain hope of affording relief, until a painful and ineffectual operation has convinced them of their error. In recent cases, occurring in any of the extremities, the contraction may be confined to the integuments, by dividing which the deformity may for a time be removed; but the same cause continuing to operate, will produce the same effect, and the cicatrix will again contract after the wound is suffered to heal up. When the contraction has been of longer duration the muscles acquire a new sphere of action, and afford an additional and powerful opposition to the free exercise of the limb. Lastly, in some cases we find that even the bony fabric becomes moulded

and altered by the powerful constriction exerted on it by this gradual but certain process. In such cases it is hardly necessary to add, that the most severe operations cannot afford a prospect of even temporary alleviation. From having witnessed several such operations, and the repeated and ineffectual transverse division of such contracting bands, I was induced to adopt a different mode of proceeding in a case which fell under my care, at the Foundling Hospital, in the year 1813. Being aware of the inefficacy of the transverse incision, I removed the whole diseased cicatrix, and endeavoured to approximate the healthy integuments from the two sides of the arm, which was kept extended on a splint, not only during the healing of the wound, but for a considerable time after the new cicatrix had formed, until, indeed, all those changes which I have described had been fully accomplished. By such a practice, I conceived that the contraction, which I knew must follow so extensive a wound, would take place in a lateral direction, and not in the long axis of the limb: in a word, I hoped to be able to *direct* and *modify* that

which it was not in my power to prevent. The success which attended this operation exceeded my most sanguine expectation. The boy's arm was perfectly restored, and remains straight to this day. The happy result which followed this operation, which was conducted on just principles, led me to consider how far those principles were applicable to the prevention of such accidents, by regulating the direction of the contractile process during and after the healing of large wounds in the neighbourhood of joints. It was quite obvious that the cases were precisely parallel, or rather, I should say, that the prevention was far easier to be effected than the cure. From that moment I have practised and taught the application of these simple principles, with the best possible effects in my own practice, and my arguments have induced many to adopt the plan; yet I regret to add, that every year cases are admitted into this hospital, requiring the employment of severe and painful operations to remedy defects resulting from ignorance or inattention. Since the first case which occurred at the Foundling, I have operated on more than twenty cases, with success; and

have had the satisfaction of receiving accounts of equal success from some of my oldest and most valued friends; particularly from Mr. Brodie, Mr. James of Exeter, and Mr. Hodgson of Birmingham.

Mr. James constructed a very ingenious apparatus for maintaining the chin elevated after operations for relieving contractions of the neck. This plan, with certain modifications, I have found most beneficial not only in curing, but also in preventing such contractions. In slighter cases the wearing, night and day, a stiff soldier's collar will be sufficient protection against contraction, provided the integument immediately below the chin be not burnt. It has been asked, At how distant a period from the receipt of the injury success may be obtained? This must, of course, depend upon the situation of the burn, and extent to which the muscles and bones are implicated in the mischief. I have, however, been truly astonished to find at how remote a period contractions of the fingers, hands, and arms may be restored. A young lady, aged 17, applied to me for an affection of her spine: during my attendance, I observed that her right hand was much de-

formed, in consequence of very firm cicatrices which bound down her thumb and three fingers, so as to greatly interfere with the use of the hand. She had been burnt when quite an infant, and the defect had existed for nearly 16 years, growing with her growth. From this history it was to be apprehended that the tendons and muscles would afford a serious obstacle to any improvement. I proposed, however, to make a trial with only one finger, and explained my views to the lady and her friends. She cheerfully acquiesced, as she was very desirous of being able to reach an octave on the piano-forte, being very fond of music. I succeeded so perfectly with the first finger that I proceeded with the others, and the thumb; and, eventually, restored the hand, and enabled my patient to attain the object of her ambition.

In performing operations for the removal of contractions, it will generally be better to excise the indurated cicatrix, although in some cases it may be divided on both sides, and dissected upwards or downwards, leaving it attached at one extremity; some portion will thus be retained, and the extent of wound will be less. In several cases, however, where

this has been attempted, the detached cicatrix has sloughed, and no time has been gained. As the cicatrix is not a part of original formation it possesses less vitality, and is often very imperfectly nourished; when, therefore, only partially detached, it will generally perish. It often happens, that but little apparent good is effected at the time of the operation; but, by gradually extending the limb, in a few days the muscles and soft parts yield, and the contraction will be gradually removed. This occurs in a marked degree in contractions at the elbow, and of the wrist and fingers. Too forcible an extension should not be attemped at first; but, with the assistance of graduated splints, a little may be gained from day to day, until the limb is perfectly restored.

It has been stated, by some surgeons, that this plan will not succeed permanently, and that the contraction will return after an apparent cure. In reply to such objections, I can only state that, in my own practice, I have never met with such a failure; and that I have investigated, with care, the alleged cases of return, and have, in each instance, satisfactorily proved, that the failure arose

from the want of perseverance in the plan after the closing of the wound, — from a want, indeed, of a sufficient knowledge of the principles on which the practice is founded, or a want of sufficient perseverance and patience on the part of the surgeon. I have been lately informed that, in some cases, Mr. Hodgson has succeeded, by mechanical extension, in removing the contraction, without any surgical operation. I have no doubt that this may be effected in some cases. I have lately adopted this practice, in two instances: the first was for a contraction in front of the neck, which was greatly benefited by the girl wearing a very firm collar for a considerable time; the other patient is, at the present time, in the hospital, in Harley's ward: a lad, who had been burnt with lightning, came in with his knee-joint contracted, nearly to a right angle; with the assistance of a powerful double screw the leg has been extended; but in this latter case the whole cicatrix has ulcerated, and the tendon of the biceps muscle can now be seen. In this instance I do not think any decided superiority can be claimed in favour of the extension in preference to excision, as the present wound is as large as

would have been made by the operation, and more time has been lost.

When I published the first case in which this operation was performed, it was brought forward as a new fact, made intelligible by a knowledge of the laws of the animal economy, and ever since I have considered myself entitled to whatever degree of credit might attach to the discovery or explanation of it. I have lately, however, accidentally ascertained, that I have no claim to originality in the operation, although my views and explanation of the rationale of the plan may belong to me. In looking over the pages of Hildanus I was struck by a rudely executed wood-cut, delineating an apparatus for restoring a contracted hand. On reading the particulars of the case I found that that excellent, but now neglected, author had perfectly succeeded in a very bad case of retroversion of the finger from burn, in completely restoring the use of the hand. I found that he had accomplished this partly by an operation, which was succeeded by a simple but powerful mode of effecting permanent extension. Towards the conclusion of his chapter, headed "De Cicatricum turpitudine earundemque Ablatione," after many

directions for softening and reducing the hardness, he says, " Si vero cicatrix adeo elevata contracta et indurata fuerit ut inde maxime turpitudo et deformitas faciei sequatur, *excidenda est* (si æger consentiat et pars affecta admittat) *lineâ in rectum quantum fieri poterit diductâ.*" In the following chapter he gives a long detail of the case alluded to above, in which this practice was adopted. I will not detain the reader by quoting all the minutiæ of treatment, but simply state, that the account of the process and cure bear all the marks of authenticity. I cannot, however, forbear to quote the concluding paragraph, which marks the humility and piety of the writer, " Atque sic Divino favore manus in integrum restituta fuit." This interesting case led me to investigate further, when I found some admirable directions for retaining the limbs extended whenever the injury occurred in the neighbourhood of important joints; directions which modern surgeons would have done well to adopt.* I further found that, in his chapter on burns, nearly all

* Interim quoque ferulæ, aliaque instrumenta apta ex ligno fabricata circumcirca juncturas ponenda sunt ut retractio nervorum impediatur.

the boasted improvements and suggestions of later days were mentioned, although, from a want of knowledge of the use of the absorbents, and other modern discoveries, the facts are explained on erroneous principles. It affords me much pleasure to rescue from oblivion the well-earned reputation of this celebrated surgeon, and, in relinquishing my own claims to originality in the operation, to render him that praise to which he is so justly entitled: — "Palmam qui meruit, ferat."

THE END.

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